AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-90 (Canceled).

91. (Currently amended) A method of caching a data object, comprising:

receiving at a first cache of a plurality of cooperating caches a first data object of a domain of data objects;

if said first data object is owned by the first cache, storing said first data object as primary content in the first cache; ~~and~~

if said first data object is owned by another cache in the plurality of caches, determining on the basis of a set of dynamic criteria whether to store said first data object as secondary content in the first cache; and

if so, storing said first data object as secondary content in the first cache;

wherein said first data object is owned by one and only one of the plurality of caches; and

wherein a ratio between primary content and secondary content in the first cache is allowed to fluctuate.

92. (Previously presented) The method of claim 91, further comprising:

identifying one of the plurality of caches as the owner of said first data object.

93. (Previously presented) The method of claim 92, wherein said identifying comprises:

hashing an identifier of said first data object to produce a hash value; and

mapping said hash value to one of said plurality of caches.

94. (Previously presented) The method of claim 91, wherein said receiving comprises receiving said first data object from said other cache in the plurality of caches.

95. (Previously presented) The method of claim 91, wherein said set of dynamic criteria includes a popularity of said first data object.

96. (Previously presented) The method of claim 91, wherein said set of dynamic criteria includes a utilization of the first cache.

97. (Previously presented) The method of claim 91, wherein said set of dynamic criteria includes a size of said first data object.

98. (Previously presented) The method of claim 91, further comprising:

removing a cached data object from the first cache;

wherein said cached data object is selected based on one or more criteria.

99. (Previously presented) The method of claim 98, wherein said one or more criteria include popularity;

wherein said popularity is measured as one or more of:

a number of requests for said cached data object; and

a frequency of requests for said cached data object.

100. (Previously presented) The method of claim 98, wherein said one or more criteria include validity.

101. (Previously presented) The method of claim 98, wherein said one or more criteria include age.

102. (Previously presented) The method of claim 98, wherein said one or more criteria include size.

103. (Previously presented) The method of claim 98, wherein said one or more criteria include ownership.

104. (Previously presented) The method of claim 98, wherein said one or more criteria include a cost of retrieving said cached data object from one of an origin server and a second cache in the plurality of caches.

105. (Previously presented) The method of claim 98, wherein said one or more criteria include a level of storage input/output activity at the first cache.

106. (Previously presented) The method of claim 98, wherein said one or more criteria include a level of communication activity at the first cache.

107. (Previously presented) The method of claim 98, wherein said one or more criteria include a level of processor activity at the first cache.

108. (Previously presented) The method of claim 91, further comprising:

propagating invalidation of said first data object between the first cache and a second cache.

109. (Previously presented) The method of claim 91, further comprising:

exchanging a configuration of the plurality of cooperating caches between the first cache and a second cache.

110. (Previously presented) The method of claim 91, further comprising:

re-configuring ownership of the domain of data objects in response to the removal of a cache from the plurality of cooperating caches.

111. (Previously presented) The method of claim 91, further comprising:

re-configuring ownership of the domain of data objects in response to the addition of a cache to the plurality of cooperating caches.

112. (Currently amended) A computer readable storage medium storing instructions that, when executed by a computer, cause the computer to perform a method of caching a data object, the method comprising:

receiving at a first cache of a plurality of cooperating caches a first data object of a domain of data objects;

if said first data object is owned by the first cache, storing said first data object as primary content in the first cache; ~~and~~

if said first data object is owned by another cache in the plurality of caches, determining on the basis of a set of dynamic criteria whether to store said first data object as secondary content in the first cache; and

if so, storing said first data object as secondary content in the first cache;

wherein said first data object is owned by one and only one of the plurality of caches; and

wherein a ratio between primary content and secondary content in the first cache is allowed to fluctuate.

113. (Currently amended) A method of caching data objects in a plurality of cooperating caches, comprising:

partitioning a set of data objects among a plurality of cooperating caches, wherein each of said caches receives ownership of a subset of said data objects;

caching one or more data objects of a first subset of said data objects at a first cache having ownership of said first subset;

caching one or more data objects of a second subset of said data objects at the first cache as secondary content, wherein a second cache in the cluster owns said second subset;

wherein a ratio between the first subset and the second subset in the first cache is allowed to fluctuate;

receiving at the first cache a first request for a first data object in said second subset of data objects;

receiving said first data object from the second cache; and

caching said first data object at the first cache only if said first data object satisfies one or more of a predetermined set of criteria.

114. (Previously presented) The method of claim 113, wherein said caching said first data object comprises caching said first data object if said first data object has a threshold level of popularity.

115. (Previously presented) The method of claim 113, wherein said caching said first data object comprises caching said first data object if the first cache has capacity to cache said first data object without first removing another data object.

116. (Previously presented) The method of claim 113, further comprising:

removing one or more cached data objects from the first cache, wherein a subset of said set of criteria is used to select said one or more cached data objects.

117. (Previously presented) The method of claim 113, wherein said predetermined set of criteria includes a popularity of said first data object.

118. (Previously presented) The method of claim 113, wherein said predetermined set of criteria includes a validity of said first data object.

119. (Previously presented) The method of claim 113, wherein said predetermined set of criteria includes a size of said first data object.

120. (Previously presented) The method of claim 113, wherein said predetermined set of criteria includes an age of said first data object.

121. (Previously presented) The method of claim 113, wherein said predetermined set of criteria includes a cost of retrieving said first data object from an origin server.

122. (Previously presented) The method of claim 113, wherein said predetermined set of criteria includes a measure of the utilization of the first cache.

123. (Previously presented) The method of claim 113, further comprising:

receiving an invalidation message regarding said first data object at one of the first cache and the second cache; and

communicating said invalidation to the other of the second cache and the first cache.

124. (Previously presented) The method of claim 113, further comprising:

automatically re-partitioning ownership of the set of data objects upon failure of one of the cooperating caches.

125. (Previously presented) The method of claim 113, further comprising:

automatically re-partitioning ownership of the set of data objects upon the addition of a cache to the plurality of cooperating caches.

126. (Currently amended) A computer readable storage medium storing instructions that, when executed by a computer, cause the computer to perform a method of caching data objects in a plurality of cooperating caches, the method comprising:

partitioning a set of data objects among a plurality of cooperating caches, wherein each of said caches receives ownership of a subset of said data objects;

caching one or more data objects of a first subset of said data objects at a first cache having ownership of said first subset;

caching one or more data objects of a second subset of said data objects at the first cache as secondary content, wherein a second cache in the cluster owns said second subset;

receiving at a first cache of a plurality of cooperating caches a first data object of a domain of data objects;

if said first data object is owned by the first cache, storing said first data object as primary content in the first cache; and

if said first data object is owned by another cache in the plurality of caches, determining on the basis of a set of dynamic criteria whether to store said first data object as secondary content in the first cache;

wherein said first data object is owned by one and only one of the plurality of caches; and

wherein a ratio between primary content and secondary content in the first cache is allowed to fluctuate;

receiving at the first cache a first request for a first data object in said second subset of data objects;

receiving said first data object from the second cache; and

caching said first data object at the first cache only if said first data object satisfies one or more of a predetermined set of criteria.

127. (Currently amended) A method of caching data objects in a plurality of cooperating caches, comprising:

partitioning a domain of data objects among a plurality of cooperating caches, wherein a first cache receives ownership of a first subset of said data objects;

caching one or more members of said first subset of data objects at the first cache;

caching one or more members of a second subset of data objects at the first cache as secondary content, wherein a second cache owns said second subset of data objects;

wherein a ratio of members of the first subset to members of the second subset is allowed to fluctuate and

removing a first cached data object from said first cache, wherein said first data object is identified by applying a predetermined set of criteria.

128. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes data object popularity.

129. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes data object validity.

130. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes data object size.

131. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes data object age.

132. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes data object ownership.

133. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes a cost of retrieving a data object from an origin server.

134. (Previously presented) The method of claim 127, wherein said predetermined set of criteria includes a measure of the utilization of the first cache.

135. (Previously presented) The method of claim 127, further comprising:

receiving at the first cache an invalidation message regarding a data object cached in the first cache; and

communicating said invalidation of said data object to another cache.

136. (Currently amended) A computer readable storage medium storing instructions that, when executed by a computer, cause the computer to perform a method of caching data objects in a plurality of cooperating caches, the method comprising:

partitioning a domain of data objects among a plurality of cooperating caches, wherein a first cache receives ownership of a first subset of said data objects;

caching one or more members of said first subset of data objects at the first cache;

caching one or more members of a second subset of data objects at the first cache as secondary content, wherein a second cache owns said second subset of data objects;

wherein a ratio between primary content and secondary content in the first cache is allowed to fluctuate; and

removing a first cached data object from said first cache, wherein said first data object is identified by applying a predetermined set of criteria.

137. (Currently amended) A hybrid cache, comprising:

a cache engine configured to cache a first subset of a domain of data objects, wherein ownership of said first subset of data objects is assigned to the hybrid cache;

a monitor configured to monitor an operational status of the hybrid cache;

an administrator configured to facilitate administration of the hybrid cache; and

communication links coupling the hybrid cache to one or more other hybrid caches;

wherein said cache engine is further configured to cache a second subset of a domain of data objects owned by a second hybrid cache as secondary content if said second data object satisfies a set of dynamic criteria;

wherein a ratio between the first subset of data objects and the second subset of data objects in the first cache is allowed to fluctuate.

138. (Previously presented) The hybrid cache of claim 137, wherein said domain of data objects is partitioned among the hybrid cache and the other hybrid caches such that each said cacheable data object is owned by just one of the hybrid caches.

139. (Previously presented) The hybrid cache of claim 137, wherein said dynamic criteria include one or more of: popularity, validity, age, size, ownership and cost of retrieving said second data object.

140. (Previously presented) The hybrid cache of claim 137, wherein one or more of said cache engine and said monitor are configured to report the invalidation of said second data object to the second hybrid cache.

141. (Currently amended) A cluster of hybrid caches, comprising:

a plurality of hybrid caches;

a set of data objects, wherein ownership of said data objects is partitioned among said hybrid caches; and

a set of criteria for applying to determine whether to cache as primary content at a first hybrid cache a data object owned by a second hybrid cache;

wherein each of said hybrid caches is configured to always cache a first received data object that it owns and to apply said set of criteria to determine whether to cache a second received data object as secondary content that belongs to a different hybrid cache, and if so, store said first data object as secondary content in the first hybrid cache;

wherein a ratio between primary content and secondary content in the first cache is allowed to fluctuate.